Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1-44. (Canceled).

45. (New) A method for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the method including:

maintaining a reference count for one or more of the objects, said reference count indicating the number of incoming pointers to each object;

recording a timestamp for an object when said reference count for said object changes;

reviewing in reverse chronological order said timestamps for each of said objects which are cyclic garbage, and for each timestamp found:

indicating that the object corresponding to said timestamp is dead; and

indicating that any object reachable from said object corresponding to said timestamp is dead.

46. (New) The method of claim 45, further including executing a garbage collection, said garbage collection indicating one or more objects which are cyclic garbage.

47. (New) The method of claim 45, wherein said timestamp is a counter which is incremented on a pointer store.

48. (New) The method of claim 45, wherein the lifetime of an object is the period between the time it is created and the time it dies.

49. (New) The method of claim 48, wherein the time an object dies can be traced to the timestamp of when it was indicated the object was dead.

50. (New) The method of claim 45, wherein each time a change is made to the graph structure, a record is generated, one field in said record being said timestamp.

51. (New) The method of claim 45, further including repeating said reviewing each time a garbage collection is executed.

52. (New) The method of claim 46, wherein said executing includes detecting objects which are cyclic garbage by invoking a tracing collector.

53. (New) The method of claim 52, wherein said tracing collector is a mark-sweep collector.

54. (New) A method for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the method including:

recording a timestamp for an object when said reference count for said object is decremented;

executing a garbage collection, said garbage collection indicating one or more objects which are cyclic garbage;

reviewing in reverse chronological order said timestamps for each of said objects, and for each timestamp found:

if said object is cyclic garbage:

indicating that the object corresponding to said timestamp is dead; and

indicating that any object reachable from said object corresponding to said timestamp is dead.

55. (New) The method of claim 54, wherein said timestamp is a counter which is incremented on every pointer deletion.

56. (New) The method of claim 54, wherein the lifetime of an object is the period between the time it is created and the time it dies.

57. (New) The method of claim 56, wherein the time an object dies can be traced to the timestamp of when it was indicated the object was dead.

58. (New) The method of claim 54, wherein each time a change is made to the graph structure, a record is generated, one field in said record being said timestamp.

58. (New) The method of claim 54, further including repeating said reviewing each time a garbage collection is executed.

60. (New) The method of claim 54, wherein said executing includes detecting objects which are cyclic garbage by invoking a tracing collector.

61. (New) The method of claim 60, wherein said tracing collector is a mark-sweep collector.

62. (New) An apparatus for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the apparatus including:

a memory;

a reference count maintainer coupled to said memory;

a timestamp recorder coupled to said memory and to said reference count maintainer;

a reverse chronological order timestamp reviewer coupled to said garbage collector and to said memory, said reverse chronological order timestamp reviewer having a dead timestamp object indicator and a dead reachable object indicator.

63. (New) The apparatus of claim 62, wherein said memory includes a counter which is incremented on a pointer store.

64. (New) An apparatus for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the apparatus including:

a memory;

a timestamp recorder coupled to said memory;

a garbage collector coupled to said memory; and

a reverse chronological order timestamp reviewer coupled to said garbage collector and to said memory, said reverse chronological order timestamp reviewer having a dead timestamp object indicator and a dead reachable object indicator.

65. (New) The apparatus of claim 64, wherein said memory includes a counter which is decremented on a pointer deletion.

66. (New) The apparatus of claim 64, wherein said garbage collector includes a tracing collector.

67. (New) The apparatus of claim 66, wherein said tracing collector is a mark-sweep collector.

68. (New) An apparatus for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the apparatus including:

means for maintaining a reference count for one or more of the objects, said reference count indicating the number of incoming pointers to each object;

means for recording a timestamp for an object when said reference count for said object changes;

means for reviewing in reverse chronological order said timestamps for each of said objects which are cyclic garbage, and for each timestamp found:

indicating that the object corresponding to said timestamp is dead; and

indicating that any object reachable from said object corresponding to said timestamp is dead.

69. (New) The apparatus of claim 68, further including means for executing a garbage collection, said garbage collection indicating one or more objects which are cyclic garbage.

70. (New) The apparatus of claim 68, wherein said timestamp is a counter which is incremented on a pointer store.

71. (New) The apparatus of claim 68, wherein the lifetime of an object is the period between the time it is created and the time it dies.

72. (New) The apparatus of claim 71, wherein the time an object dies can be traced to the timestamp of when it was indicated the object was dead.

73. (New) The apparatus of claim 68, wherein each time a change is made to the graph structure, a record is generated, one field in said record being said timestamp.

74. (New) The apparatus of claim 68, further including means for repeating said reviewing each time a garbage collection is executed.

75. (New) The apparatus of claim 69, wherein said executing includes detecting objects which are cyclic garbage by invoking a tracing collector.

76. (New) The apparatus of claim 75, wherein said tracing collector is a mark-sweep collector.

77. (New) An apparatus for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the apparatus including:

means for recording a timestamp for an object when said reference count for said object is decremented;

means for executing a garbage collection, said garbage collection indicating one or more objects which are cyclic garbage;

means for reviewing in reverse chronological order said timestamps for each of said objects, and for each timestamp found:

if said object is cyclic garbage:

indicating that the object corresponding to said timestamp is dead; and

indicating that any object reachable from said object corresponding to said timestamp is dead.

78. (New) The apparatus of claim 77, wherein said timestamp is a counter which is incremented on every pointer deletion.

79. (New) The apparatus of claim 77, wherein the lifetime of an object is the period between the time it is created and the time it dies.

80. (New) The apparatus of claim 79, wherein the time an object dies can be traced to the timestamp of when it was indicated the object was dead.

81. (New) The apparatus of claim 77, wherein each time a change is made to the graph structure, a record is generated, one field in said record being said timestamp.

82. (New) The apparatus of claim 77, further including means for repeating said reviewing each time a garbage collection is executed.

83. (New) The apparatus of claim 77, wherein said means for executing includes means for detecting objects which are cyclic garbage by invoking a tracing collector.

84. (New) The apparatus of claim 83, wherein said tracing collector is a mark-sweep collector.

85. (New) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the method including:

maintaining a reference count for one or more of the objects, said reference count indicating the number of incoming pointers to each object;

recording a timestamp for an object when said reference count for said object changes;

reviewing in reverse chronological order said timestamps for each of said objects which are cyclic garbage, and for each timestamp found:

indicating that the object corresponding to said timestamp is dead; and

indicating that any object reachable from said object corresponding to said timestamp is dead.

86. (New) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform a method for measuring the lifetime of objects in a garbage-collected system, the objects organized in a graph structure, the method including:

recording a timestamp for an object when said reference count for said object is decremented;

executing a garbage collection, said garbage collection indicating one or more objects which are cyclic garbage;

reviewing in reverse chronological order said timestamps for each of said objects, and for each timestamp found:

if said object is cyclic garbage:

indicating that the object corresponding to said timestamp is dead; and

indicating that any object reachable from said object corresponding to said timestamp is dead.